

**CPC****COOPERATIVE PATENT CLASSIFICATION****C23F**

**NON-MECHANICAL REMOVAL OF METALLIC MATERIAL FROM SURFACE** (working metal by laser beams [B23K 26/00](#); desurfacing by applying flames [B23K 7/00](#); working of metal by electro-erosion [B23H](#) ; producing decorative effects by removing surface material, e.g. by engraving, by etching, [B44C 1/22](#); electrolytic etching or polishing [C25F](#) )

**INHIBITING CORROSION OF METALLIC MATERIAL OR INCRUSTATION IN GENERAL**

**MULTI-STEP PROCESSES FOR SURFACE TREATMENT OF METALLIC MATERIAL INVOLVING AT LEAST ONE PROCESS PROVIDED FOR IN CLASS [C23](#) AND AT LEAST ONE PROCESS COVERED BY SUBCLASS [C21D](#) OR [C22F](#) OR CLASS [C25](#) .**

**NOTE**

protective layers or coating compositions or methods of applying them; these are classified in the appropriate places, e.g. [B05](#) , [B44](#) , [C09D](#) , [C23C](#) .

mechanical devices or constructional features of particular articles for inhibiting incrustation; these are classified in the appropriate places, e.g. in pipes or pipe fittings [F16L 58/00](#).

articles characterised by being made of materials selected for their properties of resistance to corrosion or incrustation; these are classified in the appropriate places, e.g. turbine blades [F01D 5/28](#).

**Guide heading:**

- C23F 1/00**      **Etching metallic material by chemical means** (manufacture of printing surfaces [B41C](#) ; manufacture of printed circuits [H05K](#) )
- C23F 1/02      .    Local etching
- C23F 1/04      . .    Chemical milling
- C23F 1/06      .    Sharpening files
- C23F 1/08      .    Apparatus, e.g. for photomechanical printing surfaces (photo- mechanical reproduction [G03F](#) )
- C23F 1/10      .    Etching compositions ([C23F 1/44](#) takes precedence)
- C23F 1/12      . .    Gaseous compositions
- C23F 1/14      . .    Aqueous compositions
- C23F 1/16      . . .    Acidic compositions ([C23F 1/42](#) takes precedence)
- C23F 1/18      . . . .    for etching copper or alloys thereof
- C23F 1/20      . . . .    for etching aluminium or alloys thereof
- C23F 1/22      . . . .    for etching magnesium or alloys thereof

- C23F 1/26 . . . . for etching refractory metals
- C23F 1/28 . . . . for etching iron group metals
- C23F 1/30 . . . . for etching other metallic material
- C23F 1/32 . . . Alkaline compositions ([C23F 1/42](#) takes precedence)
- C23F 1/34 . . . . for etching copper or alloys thereof
- C23F 1/36 . . . . for etching aluminium or alloys thereof
- C23F 1/38 . . . . for etching refractory metals
- C23F 1/40 . . . . for etching other metallic material
- C23F 1/42 . . . containing a dispersed water-immiscible liquid
  
- C23F 1/44 . Compositions for etching metallic material from a metallic material substrate of different composition
  
- C23F 1/46 . Regeneration of etching compositions
  
- C23F 3/00                   Brightening metals by chemical means**
  
- C23F 3/02 . Light metals
- C23F 3/03 . . with acidic solutions
  
- C23F 3/04 . Heavy metals
- C23F 3/06 . . with acidic solutions
  
- C23F 4/00                   Processes for removing metallic material from surfaces, not provided for in group [C23F 1/00](#) or [C23F 3/00](#)**
  
- C23F 4/02 . by evaporation
- C23F 4/04 . by physical dissolution
  
- C23F 11/00               Inhibiting corrosion of metallic material by applying inhibitors to the surface in danger of corrosion or adding them to the corrosive agent (adding inhibitors to mineral oil, fuels, or lubricants [C10](#) ; adding inhibitors to pickling solutions [C23G](#) )**
  
- C23F 11/02 . in air or gases by adding vapour phase inhibitors
- C23F 11/04 . in markedly acid liquids
- C23F 11/06 . in markedly alkaline liquids
- C23F 11/08 . in other liquids
- C23F 11/10 . . using organic inhibitors

**NOTE**

A compound is classified in the last appropriate place.

Esters or anhydrides of organic acids are classified as the relevant acid

unless otherwise indicated. Salts of a compound with an inorganic compound are classified as that compound unless specifically provided for.

C23F 11/12	...	Oxygen-containing compounds
C23F 11/122	....	Alcohols
		Aldehydes
		Ketones
C23F 11/124	....	Carboxylic acids
C23F 11/126	.....	Aliphatic acids
C23F 11/128	....	Esters of carboxylic acids
C23F 11/14	...	Nitrogen containing compounds
C23F 11/141	....	Amines
		Quaternary ammonium compounds
C23F 11/142	.....	Hydroxy amines
C23F 11/143	.....	Salts of amines
C23F 11/144	....	Aminocarboxylic acids
C23F 11/145	....	Amides
		N-substituted amides
C23F 11/146	....	containing a multiple nitrogen-to-carbon bond
C23F 11/147	....	containing a nitrogen-to-oxygen bond
C23F 11/148	....	containing a nitrogen-to-nitrogen bond
C23F 11/149	....	Heterocyclic compounds containing nitrogen as hetero atom
C23F 11/16	...	Sulfur containing compounds
C23F 11/161	....	Mercaptans
C23F 11/162	....	Thioaldehydes
		Thioketones
C23F 11/163	....	Sulfonic acids
C23F 11/164	....	containing a -SO <sub>2</sub> -N group
C23F 11/165	....	Heterocyclic compounds containing sulfur as hetero atom
C23F 11/167	...	Phosphorus-containing compounds
C23F 11/1673	....	Esters of phosphoric or thiophosphoric acids
C23F 11/1676	....	Phosphonic acids
C23F 11/173	...	Macromolecular compounds
C23F 11/18	..	using inorganic inhibitors
C23F 11/181	...	Nitrogen containing compounds
C23F 11/182	...	Sulfur, boron or silicon containing compounds
C23F 11/184	...	Phosphorous, arsenic, antimony or bismuth containing compound
C23F 11/185	...	Refractory metal-containing compounds
C23F 11/187	...	Mixtures of inorganic inhibitors
C23F 11/188	....	containing phosphates
<b>C23F 13/00</b>		<b>Inhibiting corrosion of metals by anodic or cathodic protection</b>

- C23F 13/005 . {Anodic protection }
- C23F 13/02 . cathodic  
Selection of conditions, parameters or procedures for cathodic protection, e.g. of electrical conditions
- C23F 13/04 . . Controlling or regulating desired parameters
- C23F 13/06 . . Constructional parts, or assemblies of cathodic-protection apparatus
- C23F 13/08 . . . Electrodes specially adapted for inhibiting corrosion by cathodic protection  
Manufacture thereof  
Conducting electric current thereto
- C23F 13/10 . . . . Electrodes characterised by the structure ([C23F 13/16 takes precedence](#))
- C23F 13/12 . . . . Electrodes characterised by the material ([C23F 13/16 takes precedence](#))
- C23F 13/14 . . . . . Material for sacrificial anodes
- C23F 13/16 . . . . Electrodes characterised by the combination of the structure and the material
- C23F 13/18 . . . . Means for supporting electrodes
- C23F 13/20 . . . . Conducting electric current to electrodes
- C23F 13/22 . . . . Monitoring arrangements therefor

**C23F 14/00** **Inhibiting incrustation in apparatus for heating liquids for physical or chemical purposes** ([adding scale preventives or removers to water C02F 5/00](#)) {[inhibiting incrustation in polymerisation reactors C23F 15/005](#) }

- C23F 14/02 . by chemical means

**C23F 15/00** **Other methods of preventing corrosion or incrustation**

- C23F 15/005 . {Inhibiting incrustation }

**C23F 17/00** **Multi-step processes for surface treatment of metallic material involving at least one process provided for in class [C23](#) and at least one process covered by subclass [C21D](#) or [C22F](#) or class [C25](#) ([C23C 28/00 takes precedence](#))**

**Guide heading:**

**C23F 2201/00** **Type of materials to be protected by cathodic protection**

- C23F 2201/02 . Concrete, e.g. reinforced

**Guide heading:**

**C23F 2213/00** **Aspects of inhibiting corrosion of metals by anodic or cathodic protection**

- C23F 2213/10 . Controlling or regulating parameters

- C23F 2213/11
  - .. for structures subject to stray currents
- C23F 2213/20
  - . Constructional parts or assemblies of the anodic or cathodic protection apparatus
- C23F 2213/21
  - .. combining at least two types of anodic or cathodic protection
- C23F 2213/22
  - .. characterized by the ionic conductor, e.g. humectant, hydratant or backfill
- C23F 2213/30
  - . Anodic or cathodic protection specially adapted for a specific object
- C23F 2213/31
  - .. Immersed structures, e.g. submarine structures
- C23F 2213/32
  - .. Pipes